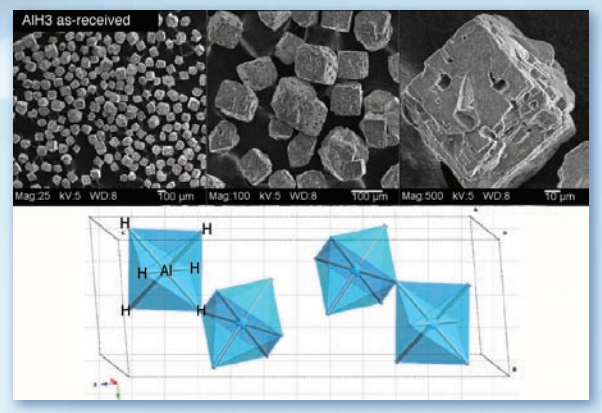
Activated Aluminum Hydride Hydrogen Storage Compositions and Uses Thereof

Product

An activated aluminum hydride (AlH_3) composition to control and efficiently store hydrogen gas for vehicles and other applications at low temperatures including room temperature and with acceptable gravimetric H-capacity (e.g., around 6 wt.% H). The decomposition of aluminum hydride particles is metallurgically stimulated by mixing in small levels of dopants (e.g., LiH, NaH, $LiAlH_4$, and others) to react with the aluminum hydride particles.



SEM micrographs of α AlH_3 prepared by DOW Chem. Co. showing large cuboids 50-100 microns in diameter. (below) crystal structure of α-AlH_3 (R-3c) showing the H atoms in an octahedral coordination around the Al.

Competitive Advantage

This technology offers a means for practical room temperature hydrogen desorption from aluminum hydride which does not require simultaneous processing in the presence or absence of metal catalysts or other dopants and/or which are not alkali metal alanates doped with such metal catalysts. Hydrogen is one part of a balanced, strategic portfolio of energy alternatives to increase the fuel economies of vehicles as well as other applications that require an energy supply. This technology has the potential to meet volumetric (and gravimetric) system targets set by a program with the U.S. Department of Energy and the U.S. Council for Automotive Research.

Applications

The automotive industry and other industries that require an energy source for mobile applications from a broader perspective as well as in a narrower perspective, the hydrogen fuel cell industry, can benefit from this technology.

Reference: Sandrock et al., "Alkali Metal Hydride Doping of a-AlH3 for Enhanced H2 Desorption Kinetics", Journal of Alloys and Compounds, 421 185-189 (2006).

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License Status

Available for Licensing

- Non-Exclusive
- Exclusive

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